

PRELIMINARY GEOLOGIC MAP CHAMBERLAIN QUADRANGLE, S. DAK.

EXPLANATION

52-164

(A blanket of Pleistocene and Recent loess mantles the quadrangle. Over areas directly underlain by Pierre shale the loess generally is less than three feet thick, over areas underlain by Iowan and older deposits the loess is 1 to 18 feet thick, and over areas underlain by post-Iowan deposits the loess is 1 to 3 feet thick.)

Qa

Alluvium and colluvium

Flood plain deposits as much as 75 feet thick and sandbars in Missouri River. Unit includes colluvium (creep and slope wash) where mapped.

Qlq Qlp Qlpg Qln Ql

Landslide deposits

Slumped shale, till, sand and gravel. (Qlq) is slumped Pleistocene material, including till and stratified sand and gravel. (Qlp) is slumped Pierre shale. (Qlpg) is the same, burying part of a terrace of White River gravel. (Qln) is slumped Niobrara formation. (Ql) is undifferentiated slump material.

Qwm

Outwash(?) deposits

Terrace deposits generally little modified by gullies. Lithology resembles that of alluvium being deposited in the same areas today: in terraces of the Missouri, silt and sand reaching a thickness of at least 40 feet; in terraces of local streams (American Crow and American Creeks) clay containing some stones, chiefly concretions from the Pierre shale.

Qwco

Outwash deposits

Moderately dissected terrace deposits of stratified silt, sand, and gravel, with a few boulders, possibly ice-rafted. Remnants of a deposit that filled the Missouri trench to a profile perhaps 70 feet above present river level. Mantled with eolian sand (Mankato?) to a depth of about 2 feet.

Qwci

Ice-contact sand and gravel deposits

Stratified glacial sand and gravel, with a maximum thickness of at least 20 feet and perhaps as much as 60 feet, forming two terraces 350 feet above the Missouri River north and northeast of Oacoma. Pebbles are largely granites and carbonates; a few cobbles are present. Many of the stones are coated with calcium carbonate.

Qwct

Till and till-equivalent

Clayey till underlying the Cary(?) ice-contact terrace deposits.

Qwg

Post-Iowan gravel deposits

Terrace deposits of 1 to 3 feet of pebble gravel of western origin, deposited by the White River. Locally overlain by glacial boulders.

Qwio

Outwash deposits

Much-eroded remnants of a valley train of sand and gravel that filled the Missouri trench to a profile more than 200 feet above present river surface. In general, the upper part is largely sand, the lower part pebble gravel, with a few cobbles and boulders as much as 2½ feet in diameter. In places gravel consists almost entirely of nodules from the Pierre shale but generally granitic and carbonate rocks are abundant. Sandy eolian deposits occur locally on the mass-wasted slopes of the remnants.

Qwh

Ice-contact (?) deposit

Sand, with some gravel beds, chiefly near its base. Probably as much as 40 feet thick. Iowan (?) loess, Cary (?) gravel, Cary loess, and local colluvium rest on it in places.

Qwit

Iowan (and Tazewell?) till

Till is less than 2 feet thick on uplands west of the Missouri River and in many places consists of a mere scattering of stones. The till contains many stones of western origin reworked from White River gravels. East of the Missouri, the early Wisconsin till is much thicker, and may be partly Tazewell; it consists largely of clayey materials derived from the underlying Pierre shale and Illinoian till, in addition to stones brought from the northeast. In most places this till is overlain by up to 15 feet of early Wisconsin and Cary loesses.

Qit

Till

Hard, jointed till, consisting largely of clay with few stones, and deeply stained by weathering. Believed to occur only east of the Missouri River.

Qig

Illinoian(?) gravel deposit

Stratified coarse sand and pebble gravel consisting largely of chalcedony, quartz, and perthitic feldspar, deposited by the White River. Grades upward into sand and silt. At least 17 feet thick. The deposit is deeply buried under later till and eolian deposits, and is exposed only where these have been removed by erosion.

Oyg

Yarmouth gravel deposits

Stratified sand and pebble gravel consisting largely of chalcedony, quartz, and perthitic feldspar, probably nowhere more than 10 feet thick and in many places consisting of a mere scattering of stones. A veneer left on planation surfaces cut by the White River and a former tributary, now buried under eolian and partly under glacial deposits.

Kpv

Verendrye and overlying members

Includes the Verendrye, Virgin Creek, and Mobridge members of the Pierre shale; The Mobridge member is calcareous; the others are bentonitic claystones and mudstones with thin bentonite beds. Total thickness exposed is more than 200 feet. All the members are subject to sliding.

Kpd

Crow Creek and DeGrey members

The Crow Creek is a marl, generally 6 or 8 feet thick, with 6 inches to 2 feet of highly calcareous siltstone near its base. The overlying DeGrey, about 50 feet thick, is a bentonitic claystone with many thin bentonite beds; nodules of iron-manganese carbonate, which weather black, are so abundant that on outcrops seen from a distance the DeGrey forms a conspicuous black band above the Crow Creek. The member is extremely subject to sliding.

Kpg

Gregory member

Bentonitic clay and claystone, with a marl layer locally present at or near its base. Thickness probably ranges from 70 to 90 feet. Subject to landsliding.

Kps

Sharon Springs member

Bituminous black shale, with numerous thin bentonite beds in its lower half. Thickness probably ranges from 10 to 30 feet. Generally weathers to silvery gray chips, but locally, where exposures have caught fire, red. Subject to sliding.

Kn

Niobrara formation

Soft, gray to black chalk, weathering yellowish-brown to almost white. Consists largely of foraminiferal shells; thin beds of bentonite and seams of gypsum may be present. Total thickness not exposed but is more than 100 feet. More resistant to erosion than the poorly consolidated bentonitic strata forming the bulk of the Pierre shale, but subject to slumping in area.

Contact, accurately located

Contact, approximate

Contact, covered

Paved U. S. Highway

Graveled, all-weather road

Road passable in dry weather

Railroad (tracks in yards omitted)

County line

Section or township line (shown where road is not present)

Farmhouse (houses omitted in built-up areas of Chamberlain and Oacoma)

School

Section corner, recovered

Cemetery

NOTE: All beds exposed in this quadrangle, including the oldest, are believed to be essentially undeformed structurally. Any exposure showing an appreciable dip is believed to have been tilted by landslide or other surficial movement, rather than by tectonic deformation.